Turfgrass Management

Turfgrass is the most widely used ornamental crop in this country and is a multibillion-dollar-a-year business. This course will cover the history of turfgrass in this country and the management techniques utilized today in various turfgrass applications. Students will apply these techniques as they prepare for a career in turfgrass management.

Pre-requisites: **None**

Recommended Credit: **½ or 1**

Recommended Grade Levels: **10th, 11th or 12th**

***** **½ denotes learning expectations that must be met when teaching the course for ½ credit.**

****** **All learning expectations must be met when teaching the course for 1 credit.**

Turfgrass Management

Standard 1.0
The student will assess the diversity, importance, career opportunities, and skills needed for the turfgrass industry.

Standard 2.0
The student will evaluate why different turfgrasses are adapted to particular temperature zones.

Standard 3.0
The student will analyze the components and the importance of soils to turfgrass growth.

Standard 4.0
The student will evaluate turfgrass selection, site selection, planting time, establishment methods, care, and fertilization.

Standard 5.0
The student will recommend techniques for mowing and watering turfgrass for maximum growth and reproduction.

Standard 6.0
The student will summarize the principles of integrated pest management, pesticide application and safety.

Standard 7.0
The student will evaluate weed control programs for turfgrass.

Standard 8.0
The student will propose the basic design, layout, features, and maintenance of golf courses.

Standard 9.0
The student will summarize the establishment, maintenance, and development of a professional lawn.

Standard 10.0
The student will assess the importance of records, work schedules, budget preparation, and estimation of job cost to the turfgrass manager.

Standard 11.0
The student will integrate academic competencies with turfgrass management.

Standard 12.0
The student will develop premier leadership and personal growth to strengthen turfgrass management skills.

Turfgrass Management

Course Description:
Turfgrass is the most widely used ornamental crop in this country and is a multi-billion dollar a year business. This course will cover everything from the history of turfgrass to the techniques used for the management of turfgrass in various applications. Students will be able to identify major problems that exist with turfgrass and explain ways to solve these problems.

Standard 1.0

The student will assess the diversity, importance, career opportunities, and skills needed for the turfgrass industry.

Learning Expectations:
The student will:

1.1	Evaluate jobs available in turfgrass maintenance.	½
1.2	Interpret the history of turfgrass and it significance to the horticulture industry.	½
1.3	Evaluate the skills needed in turfgrass maintenance.	½

Evidence Standard is Met:
The student will:

- Compare the advantages and disadvantages of jobs available in turfgrass maintenance.
- Propose motor and academic skills needed to work in turfgrass maintenance.
- Evaluate the impact turfgrass has had on the horticulture industry.

Integration/Linkages
Language Arts, Biology, Social Studies, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Standards

- Explain the diversity and importance of turfgrass.
- Rate career opportunities in the turfgrass industry based on income and positions available in the local community.
- Create a portfolio of information that address the skills needed by a turfgrass manager.

Standard 2.0

The student will evaluate why different turfgrasses are adapted to particular temperature zones.

Learning Expectations:
The student will:

2.1	Summarize the major differences between cool and warm season turfgrasses.	½
2.2	Specify characteristics of cool season grasses.	½
2.3	Specify characteristics of warm season grasses.	½

Evidence Standard is Met:
The student will :

- Compare the differences between cool and warm season turfgrasses.
- Select the appropriate cool season grass based on its use and location.
- Select the appropriate warm season grass based on its use and location.

Integration/Linkages
Language Arts, Geography, Biology, Ecology, Social Studies, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Determine how grass plants grow and reproduce.
- Evaluate turf quality of various turf species.
- Assess the characteristics of the warm season turfgrasses.
- Present the location and function for which each warm season grass is used.

- Demonstrate how a turf manager selects the best species and cultivar or varieties for a particular site.
- Compare characteristics of the seeds of six warm and cool season turfgrasses.
- Assess the characteristics and uses of cool season grasses.
- Recommend cool season grasses for particular uses.
- Choose turfgrass seeds and the percentage of each used for a typical lawn seed mixture for cool season turfgrass lawns.

Standard 3.0

The student will analyze the components and the importance of soils to turfgrass growth.

Learning Expectations:

The student will:

3.1	Assess the importance of soil fertility to plant growth.	½
3.2	Distinguish between the soil components.	½
3.3	Contrast the characteristics of a good soil with a bad soil.	½
3.4	Evaluate ways to improve the quality of the soil.	½
3.5	Assess how pH affects nutrient uptake by plants.	½
3.6	Evaluate the use of soil tests to improve soil quality.	½

Evidence Standard is Met:

The student will:

- Classify a good and a bad soil profile.
- Compare the importance of different soil components.
- Demonstrate how soil can affect plant growth.
- Prescribe ways to improve the quality of the soil.
- Demonstrate how to take a representative soil sample.
- Determine fertilizer and lime requirements from a soil test.

Integration/Linkages

Language Arts, Algebra, Chemistry, Geography, Ecology, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Describe the components of soil and their effect on nutrient availability.
- Summarize how soil texture and structure affect plant growth.
- Illustrate a soil profile in class.
- Explain how undesirable soil conditions can be improved by modifying the soil.
- Recommend the most effective methods of soil modification.
- Prescribe organic matter sources that can be used to improve soil structure.
- Select appropriate drainage systems that are designed to remove excess water from the soil.
- Demonstrate how to take a representative soil sample.
- Evaluate the effects pH has on different grasses.
- Critique the results of a soil sample test.

Standard 4.0

The student will evaluate turfgrass selection, site selection, planting time, establishment methods, care, and fertilization.

Learning Expectations:

The student will:

4.1	Evaluate the use of specific turfgrass species for a site.	½
4.2	Select planting times depending on the variety of turf.	½
4.3	Prescribe methods of establishing turfgrass and its care.	½
4.4	Summarize site preparation needed before establishing a turf.	½

Evidence Standard is Met:

The student will:

- Compare methods of turfgrass establishment and the care needed for turf growth.
- Specify traits for a good turfgrass site.
- Propose methods for turf site preparation.
- Recommend planting times and the varieties that should be planted at that time.

Integration/Linkages

Language Arts, Geography, Biology, Ecology, Mathematics, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Present the species and cultivars that are to be planted on a site.
- Classify grasses by their use and season.
- Summarize the functions of important grass plant structures.
- Specify how the site should be prepared before planting.
- Recommend the most appropriate times of year for turfgrass establishment.
- Compare the five methods of turfgrass establishment.
- Explain how the new planting should be cared for until the turfgrass is well established.
- Assess the factors that influence the selection of an appropriate fertility program.
- Recommend the rate and frequency of fertilizer application for turfgrass.
- Summarize methods of fertilizer application.

Standard 5.0

The student will recommend techniques for mowing and watering turfgrass for maximum growth and reproduction.

Learning Expectations:

The student will:

5.1	Evaluate methods and techniques used in mowing turf.	½
5.2	Assess the efficiency of different types of mowers.	½
5.3	Assess the importance of irrigating a turf.	
5.4	Evaluate methods of irrigation for a turfgrass.	

Evidence Standard is Met:

The student will:

- Demonstrate the proper techniques in mowing turf.
- Analyze methods and the importance of irrigation.
- Research different types of mowers and their qualities.

Integration/Linkages

Language Arts, Mathematics, Biology, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Explain why correct mowing practices are important to the quality of the turf.
- Evaluate the factors that determine how often turfgrass should be cut.
- Compare the advantages and disadvantages of different types of mowers.
- Compare the advantages and disadvantages of collecting grass clippings.
- Demonstrate how water moves in the soil.
- Question whether all soil-water is not available for plant use.
- Summarize the signs that indicate when irrigation is needed.
- Calculate the amount of water needed by a turf.
- Evaluate the efficiency of different irrigation systems.

Standard 6.0

The student will summarize the principles of integrated pest management, pesticide application and safety.

Learning Expectations:
The student will:
6.1 Analyze the principles of integrated pest management and insect and disease control.
6.2 Assess the types of pesticides available in the turfgrass industry.
6.3 Evaluate safety procedures to be used for proper pesticide application.
6.4 Analyze the major insects and diseases that affect turfgrass.

Evidence Standard is Met:
The student will:
- Determine what is needed for an integrated pest management, IPM, plan.
- Outline a pest control program, explaining what method of IPM should be used and if any chemicals should also be used.
- Collect types of pesticides available and determine what they control.
- Demonstrate the use of personal protection equipment.
- Demonstrate proper pesticide application.

Integration/Linkages
Language Arts, Mathematics, Chemistry, OSHA Standards, TOSHA Standards, EPA Regulations, Biology, Ecology, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks
- Justify the principles of integrated pest management.
- Compare the differences of biological control and integrated pest management.
- Evaluate insects that have been effectively controlled without man-made chemicals.
- Determine diseases, which can be controlled by biological means.
- Outline a pest control program based on the different types of pesticides and formulations available to the turf manager.
- Present the process of pesticide applicator certification mandated by the Environmental Protection Agency.
- Demonstrate appropriate formulation and application of chemicals based on the label.
- Demonstrate the safe handling of chemicals.

Standard 7.0
The student will evaluate weed control programs for turfgrass.

Learning Expectations:
The student will:
7.1 Evaluate maintenance programs for turfgrass. ½
7.2 Evaluate methods of controlling weeds and insects.
7.3 Diagnose turfgrass injury.

Evidence Standard is Met:
The student will:
- Present a maintenance program for a specific turfgrass.
- Research and debate methods to control annual grasses, perennial weeds, and broadleaf weeds.

Integration/Linkages
Language Arts, Ecology, Mathematics, Biology, Chemistry, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks
- Present how a correct turfgrass maintenance program results in less weed competition.
- Compare the characteristics of important weed species.
- Compare the characteristics of different types of herbicides.
- Recommend methods for controlling annual grasses, perennial grassy weeds, and broadleaf weeds.
- Justify the rules for applying herbicides to control broadleaf weeds.

Standard 8.0

The student will propose the basic design, features, and maintenance of golf courses.

Learning Expectations:

The student will:

8.1 Evaluate the basic design and layout features of a golf course.
8.2 Prescribe the maintenance procedures performed on a golf course.
8.3 Evaluate the responsibilities of the superintendent and other employees.
8.4 Evaluate methods to improve a turfgrass.

Evidence Standard is Met:

The student will:

- Draw basic design and layout features of a golf course.
- Determine the maintenance practices needed for healthy greens, fairways, and other course grasses.
- Use current technology to research and present methods to improve the turfgrass on a golf course.
- Specify the responsibilities of a superintendent or employee of a golf course.
- Recommend types of turf used on a golf course.

Integration/Linkages

Art, Language Arts, Biology, Drafting, Ecology, Geography, Mathematics, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Present a design and layout for a golf course.
- Summarize the responsibilities of the superintendent and other employees.
- Prepare maintenance schedule for greens, tees, fairways, sand traps, and roughs.
- Determine the areas on a golf course mowed with reel-type mowers.
- Recommend two turfgrass species for greens.
- Propose how to properly irrigate, fertilize and manage fairways and greens.
- Present a program for improving the turfgrass on a golf course.
- Recommend methods of turf renovation.

Standard 9.0

The student will summarize the establishment, maintenance, and development of a professional lawn.

Learning Expectations:

The student will:

9.1 Construct lawns, athletic fields, and other types of turf areas.
9.2 Debate the role of professional lawn care service companies in the turf industry.
9.3 Evaluate how grass seed and sod are produced.

Evidence Standard is Met:

The student will:

- Summarize the role a particular business has in the lawn industry.
- Research on the Internet how seed and sod are produced.
- Determine factors needed for the establishment and maintenance of lawns, athletic fields, cemeteries, and other turf areas.
- Compare the differences in caring for a lawn and golf course.

Integration/Linkages

Mathematics, Language Arts, Biology, Social Studies, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Debate the role of professional lawn-care service companies in the turf industry.
- Demonstrate how seeds and sod are produced.
- Recommend turfgrass species for lawns.

- Specify the primary function of utility turf.
- Compare the advantages and disadvantages of artificial turf.
- Determine why southern lawns may require more fertilizer than northern lawns.
- Compare the differences of maintenance of a lawn to a golf course.

Standard 10.0

The student will assess the importance of records, work schedules, budget preparation, and estimation of job cost to the turfgrass manager.

Learning Expectations:

The student will:

10.1	Assess the importance of business management skills in the turf industry.	½
10.2	Specify personnel management practices for working with unskilled labor.	
10.3	Evaluate the types of records that should be kept for a turf company.	
10.4	Assess the use of a budget and a work schedule in a turf company.	
10.5	Value appropriate industry-related work ethics.	½

Evidence Standard is Met:

The student will:

- Summarize business management skills needed in today's turf industry.
- Recommend different types of personnel management practices.
- Prepare a work schedule for a golf course.
- Prepare a budget for a golf course using a spreadsheet.
- Prepare income and expense statements for a turf company.

Integration/Linkages

Mathematics, Business Education, Language Arts, Marketing, Accounting, National FFA Code of Ethics, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Propose business management skills and personnel management practices needed by a turfgrass manager.
- Present records that are kept by the turfgrass manager.
- Plan work schedules and budgets using a spreadsheet.
- Demonstrate estimating job costs and using a computer.
- Demonstrate work ethics in the laboratory environment.

Standard 11.0

The student will integrate academic competencies with turfgrass management.

Language Arts:

The student will:

11.1	Demonstrate oral communication skills in presenting maintenance schedules for a turf.	½
11.2	Develop presentations for determining the type of turf needed for a particular job.	½

Mathematics:

The student will:

11.3	Propose a cost analysis of using different turfgrasses.	
11.4	Calculate percentages for mark ups and markdowns on turf materials.	
11.5	Calculate costs and profits for a turf industry.	
11.6	Perform basic mathematical computations in determining nutritional needs of lawns and turfs.	½

Science:

The student will:

11.7	Relate botany principles to turfgrass.	½

11.8	Relate principles of entomology to turfgrass.	
11.9	Use biological principles to determine appropriate grasses to plant.	½
11.10	Analyze chemical properties of soil for proper turf management.	
11.11	Analyze the effect turfgrass management has on the environment.	
11.12	Determine which soils are best suited for various turf varieties.	½

Evidence Standard is Met:

The student will:

- Research a management technique for a turf on the Internet and present the information.
- Create a presentation with visual aids on turf management techniques.
- Demonstrate the use of a computer for determining nutritional needs of a turf.
- Prepare a portfolio for managing the installation, maintenance and development of a turf.

Integration/Linkages

Language Arts, Mathematics, Biology, Ecology, Business Education, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Prepare income, expense and profit statements using computer software.
- Diagram the parts of a grass and assess their functions.
- Determine appropriate management techniques for a given turf.

Standard 12.0

The student will develop premier leadership and personal growth to strengthen turfgrass management skills.

Learning Expectations

The student will:

12.1	Plan a simulated SAEP, supervised agricultural experience program, using a turfgrass management business.
12.2	Prepare a six-to-eight-minute presentation on an aspect of turfgrass management.
12.3	Examine procedures for conducting meetings in professional organizations.
12.4	Evaluate the use a program of work to include FFA activities associated with turfgrass management.

Performance Standards

The student is able to:

- Complete records for an SAEP that is directly related to turfgrass management.
- Present a 6-8-minute oral presentation and answer questions on some aspect of turfgrass management.
- Develop a 4-5-minute oral presentation for a group meeting.
- Participate in a mock meeting, using approved parliamentary procedure.

Integration/Linkages

Mathematics, Social Studies, Language Arts, National FFA Guidelines for Public Speaking, National FFA Guidelines for Parliamentary Procedure, National FFA Guidelines for Proficiency Awards and Degrees, SCANS (Secretary's Commission on Achieving Necessary Skills), National FFA Food for America Program

Sample Performance Tasks

- Present a 6-8-minute prepared speech on some aspect of turfgrass management.
- Assess turfgrass management in an extemporaneous speech.
- Complete a proficiency award for an area related to turfgrass management.
- Complete an application for an advanced FFA degree.
- Evaluate the benefit of FFA activities to preparing for a career in the turfgrass industry.
- Participate in the FFA Food for America program.